



CIVIL-TECH CONSULTANTS AND ENGINEERS

Building & Highway Material Testing Laboratory

An ISO 9001:2008 Certified Company

NABL - Accredited Laboratory as per ISO / IEC-17025 : 2005



Job No.: CTCE/BBMP/W.No.13/KRIDL/WMM/Gradation/2014-15

18.01.2016

GRADATION FOR WMM MORTH TABLE-400-11



Customer : Asst. Executive Engineer, Shettyhalli Sub Division, BBMP, Bangalore.

Agency : Technical Manager (West), KRIDL, Bangalore.

Name of Work : Improvements and Asphaltting to Mallasandra main road from Govt. School to Anjaneya Swamy temple road in Mallasandra, Ward No.13, SSD, BBMP, Bangalore.

Reference : EE/DD/WO/447/2013-14 Dated: 08.03.2013

Date of Testing : 18.01.2016

Material : WMM

Sample Location : WMM Mix Plant

Oven Dry Wt (gm): 7330

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Spec.Limits
53	0	0	0	100	100
45	135	135	1.8	98.2	95-100
22.4	2515	2650	36.2	63.8	60-80
11.2	1205	3855	52.6	47.4	40-60
4.75	865	4720	64.4	35.6	25-40
2.36	980	5700	77.8	22.2	15-30
0.600	525	6225	84.9	15.1	8-22
0.075	980	7205	98.3	1.7	0-8

Note:

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AE
W.13
ಸಹಾಯಕ ಕಾರ್ಯಪಾಲಕ ಅಭಿಯಂತರರು
ಶಬ್ದಕೃಷ್ಣ ಉಪನಿರ್ದೇಶಕರು, ದಾಸರಹಳ್ಳಿ ವಲಯ
ಬೃಹತ್ ಬೆಂಗಳೂರು ನಗರ
1.ಎಸ್.ಎಂ ರಸ್ತೆ, ರವೀಂದ್ರನಗರ, ಬೆಂಗಳೂರು

M/s. Civil-Tech Consultants & Engineers
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Job No.: CTCE/BBMP/W.No.12/KRIDL/BM/Bitumen/2015-16

03.02.2016

BITUMEN CONTENT DETERMINATION OF BITUMINOUS MACADAM MIX

As per IS2386 and IRC:SP:11-1984

CUSTOMER	Asst. Executive Engineer, Shettyhalli Sub Division, BBMP, Bangalore.
AGENCY	Technical Manager (West), KRIDL, Bangalore.
NAME OF THE WORK	Improvements and Asphaltting to Mallasandra main road from Govt. School to Anjaneya Swamy temple road in Mallasandra, Ward No.13, SSD, BBMP, Bangalore.
REFERENCE	EE/DD/WO/447/2013-14 Dated: 08.03.2013
SAMPLE I/D	Roads in Mallasandra ward No.13.
DATE OF TESTING	03.02.2016



BITUMEN CONTENT DETERMINATION

Description	Trail 1	Trail 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	483	481.5
3. Weight of Asphalt and Mineral matter Extracted, g	-	-
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g		
6. Weight of Bitumen Extracted, g. (corrected)	17	18.50
7. Bitumen content in %	3.40	3.70
8. Average	3.55	

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Job No.: CTCE/BBMP/W.No.12/KRIDL/BM/Bitumen/2015-16

03.02.2016

GRADATION DETERMINATION OF BITUMINOUS MACADAM MIX

As per IS2386 and IRC:SP:11-1984

CUSTOMER	Asst. Executive Engineer, Shettyhalli Sub Division, BBMP, Bangalore.
AGENCY	Technical Manager (West), KRIDL, Bangalore.
NAME OF THE WORK	Improvements and Asphaltting to Mallasandra main road from Govt. School to Anjaneya Swamy temple road in Mallasandra, Ward No.13, SSD, BBMP, Bangalore.
REFERENCE	EE/DD/WO/447/2013-14 Dated: 08.03.2013
SAMPLE I/D	Roads in Mallasandra ward No.13.
DATE OF TESTING	03.02.2016



GRADATION AFTER EXTRACTION

Sieve Size in mm	Trail 1				Specified Limits as per MORTH specification table 500-04 (Grading-2)
	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	
26.5	0	0	0	100	100
19	31.52	6.53	6.53	93.47	90-100
13.2	86.23	17.85	24.38	75.62	56-88
4.75	255.4	52.88	77.26	22.74	16-36
2.36	45.36	9.39	86.65	13.35	4-19
0.3	26.31	5.45	92.10	7.90	2-10
0.075	11.22	2.32	94.42	5.58	0-8

P The results indicated above are based on the tests carried	Trail 2				Specified Limits as per MORTH specification table 500-04 (Grading-2)
	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	
26.5	0	0	0	100	100
19	30.25	6.28	6.28	93.72	90-100
13.2	82.32	17.10	23.38	76.62	56-88
4.75	250.6	52.05	75.42	24.58	16-36
2.36	46.36	9.63	85.05	14.95	4-19
0.3	25.32	5.26	90.31	9.69	2-10
0.075	12.35	2.56	92.88	7.12	0-8

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ಸಹಾಯಕ ಕಾರ್ಯದರ್ಶಿ (ಆಯುಕ್ತರು)

ಶಿಬಿರಕು ಉಪವಿಭಾಗ, ಬಸವೇಶ್ವರನಗರ

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Job No.: CTCE/BBMP/W.No.13/KRIDL/SDBC/SDBC/Sp_Wa/2015-16

04.02.2016

Specific Gravity And Water Absorption Test

IS: 2386 Part III

Customer	Asst. Executive Engineer, Shettyhalli Sub Division, BBMP, Bangalore.
Agency	Technical Manager (West), KRIDL, Bangalore.
Name of the Work	Improvements and Asphaltting to Mallasandra main road from Govt. School to Anjaneya Swamy temple road in Mallasandra, Ward No.13, SSD, BBMP, Bangalore.
Reference	EE/DD/WO/447/2013-14 Dated: 08.03.2013
Type of Mix	Semi Dense Bituminous Concrete
Source / Location	Hotmix Plant, Bangalore
Date of Testing	04.02.2016



Sl. No.	Details	Notation	Test Number			Mean Value
			Test 1	Test 2	Test 3	
1	Weight of aggregate suspended in water with the basket	$W_1 g$	2024	2025	2026	
2	Weight of basket suspended in water	$W_2 g$	755	755	755	
3	Weight of saturated aggregate in water	$(W_1 - W_2) = W_s g$	1269	1270	1271	
4	Weight of saturated surface dry aggregate in air	$W_3 g$	2016	2017	2018	
5	Weight of water equal to the volume of the aggregate	$(W_3 - W_s) g$	747	747	747	
6	Weight of oven dried aggregate	$W_4 g$	2000	2003	2001	
7	Specific Gravity	$W_4 / (W_3 - W_s)$	2.677	2.681	2.679	2.679
8	Apparent Specific gravity	$W_4 / (W_4 - W_s)$	2.736	2.733	2.741	2.737
9	Water Absorption	$((W_3 - W_4) * 100) / W_4$	0.80%	0.70%	0.85%	0.78%

Comments:

→ Maximum allowable Aggregate Water absorption value for Semi Dense Bituminous Concrete is 2.0%

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04.02.2016

BITUMEN CONTENT DETERMINATION OF SEMI DENSE BITUMINOUS CONCRETE MIX

AS per IRC:SP:-1984

CUSTOMER	Asst. Executive Engineer, Shettyhalli Sub Division, BBMP, Bangalore.
AGENCY	Technical Manager (West), KRIDL, Bangalore.
NAME OF THE WORK	Improvements and Asphaltting to Mallasandra main road from Govt. School to Anjaneya Swamy temple road in Mallasandra, Ward No.13, SSD, BBMP, Bangalore.
REFERENCE	EE/DD/WO/447/2013-14 Dated: 08.03.2013
SAMPLE I/D	Roads in Mallasandra Ward No.13.
DATE OF TESTING	04.02.2016



BITUMEN CONTENT DETERMINATION

Description	Trail 1	Trail 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	475	474.5
3. Weight of Asphalt and Mineral matter Extracted, g	-	-
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g		
6. Weight of Bitumen Extracted, g. (corrected)	25	25.50
7. Bitumen content in %	5.00	5.10
8. Average	5.05	



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04.02.2016

BITUMEN CONTENT GRADATION DETERMINATION OF SEMI DENSE BITUMINOUS CONCRETE MIX

As per IS2386 and IRC:SP:11-1984

CUSTOMER	Asst. Executive Engineer, Shettyhalli Sub Division, BBMP, Bangalore.
AGENCY	Technical Manager (West), KRIDL, Bangalore.
NAME OF THE WORK	Improvements and Asphaltting to Mallasandra main road from Govt. School to Anjaneya Swamy temple road in Mallasandra, Ward No.13, SSD, BBMP, Bangalore.
REFERENCE	EE/DD/WO/447/2013-14 Dated: 08.03.2013
SAMPLE I/D	Roads in Mallasandra Ward No.13.
DATE OF TESTING	04.02.2016



GRADATION AFTER EXTRACTION

Sieve Size in mm	Trail 1				Specified Limits as per MORTH specification table 500-15 (Grading-2)
	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	
13.2	0	0	0	100	100
9.5	24.35	5.13	5.13	94.87	90-100
4.75	260.5	54.84	59.97	40.03	35-51
2.36	51.36	10.81	70.78	29.22	24-39
1.18	35.24	7.42	78.20	21.80	15-30
0.3	36.36	7.65	85.85	14.15	9-19
0.075	35.65	7.51	93.36	6.64	3-8

Sieve Size in mm	Trail 2				Specified Limits as per MORTH specification table 500-15 (Grading-2)
	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	
13.2	0	0	0	100	100
9.5	38.59	8.13	8.13	91.87	90-100
4.75	262.5	55.32	63.45	36.55	35-51
2.36	56.34	11.87	75.33	24.67	24-39
1.18	33.32	7.02	82.35	17.65	15-30
0.3	30.22	6.37	88.72	11.28	9-19
0.075	28.56	6.02	94.74	5.26	3-8

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04.02.2016

Aggregate Gradation Test

IS : 2386 Part I

Customer	Asst. Executive Engineer, Shettyhalli Sub Division, BBMP, Bangalore.
Agency	Technical Manager (West), KRIDL, Bangalore.
Name of the Work	Improvements and Asphaltting to Mallasandra main road from Govt. School to Anjaneya Swamy temple road in Mallasandra, Ward No.13, SSD, BBMP, Bangalore.
Reference	EE/DD/WO/447/2013-14 Dated: 08.03.2013
Sample I / D	Hot Mix Plant, Bangalore
Type of Mix	Semi Dense Bituminous Concrete (SDBC)
Date of Testing	04.02.2016



Total Weight of Sample: 5300 gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Grade-II As per MORTH	Remarks
13.2	0	0.0	0	100	100	Gradation satisfies Grade-II MORTH specification
9.5	385	7.3	7.26	92.74	90-100	
4.75	2650	50.0	57.26	42.74	35-51	
2.36	645	12.2	69.43	30.57	24-39	
1.18	480	9.1	78.49	21.51	15-30	
0.3	420	7.9	86.42	13.58	9-19	
0.075	380	7.2	93.58	6.42	3-8	

Total Weight of Sample: 5200 gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Grade-II As per MORTH	Remarks
13.2	0	0.0	0	100	100	Gradation satisfies Grade-II MORTH specification
9.5	335	6.4	6.44	93.56	90-100	
4.75	2545	48.9	55.38	44.62	35-51	
2.36	835	16.1	71.44	28.56	24-39	
1.18	525	10.1	81.54	18.46	15-30	
0.3	380	7.3	88.85	11.15	9-19	
0.075	355	6.8	95.67	4.33	3-8	

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